REMARKS/ARGUMENTS

General comments:

The use of opposing layers of magnetized material that flank the free layer, serving to give it longitudinal stability, has been standard practice in the art for some time. Both the cited prior art and the present invention teach the introduction of a second pair of stabilizing layers, located either above or below the standard stabilizing layer, but magnetized in a direction that is antiparallel to that of the standard layer.

In the cited prior art, Fukui et al. refer to the 'normal' stabilizing layer as the "first magnetic domain control layer" and to the added layer as the "second magnetic domain control layer". In the present invention, we refer to the 'normal' stabilizing layer as a "pair of opposing permanent magnet layers" and to the added layer as a "pair of opposing additional bias layers".

A number pf patentable differences remain between the present invention and the prior art, as we shall enumerate below.

Reconsideration is requested of all rejections based on 35 U.S.C. 102:

Examiner has relied on Fukui et al. (2004/0047087) for this rejection. With respect to claims 1, 9, 17, and 25, Examiner lists a number of features that are common to both the present invention and the prior art. There remains, however, one important difference between these two inventions and that is the size of the gap that separates the added bias layers relative to the size of the gap that separates the standard bias

layers. Claims 1, 9, 17, and 25 (as now amended) teach that the gap between the added bias layers is less than the gap between the standard bias layers. In their text, Fukui et al. do not state the relative sizes of these gaps but from their drawings it is clear that the gap between the second magnetic domain control layers is either equal to the gap between the first magnetic domain control layers (FIGs. 1, 7, 8, and 10) or is greater than it (FIGs. 3a, 5a, and 9).

Making the smaller gap be between the added bias layers is a key feature of the present invention, the rationale for this being given in the first full paragraph on page 8.

Our claims 2, 13, 21, and 29, all teach that "said additional bias layer is selected from the group consisting of CoPt, CoCrPt, CoNiCr, NiFe/IrMn, and CoFe/IrMn whereby it has good exchange coupling field with antiferromagnetic layers, giving it an effective coercivity that is between about 0.05 and 0.75 times that of said permanent magnet layer." With respect to claims 13, 21 , and 29, Examiner argues that "the distance above/or below the permanent magnet layer is the thickness of the intermediate layer...". The relevance of this to said three claims is not understood. Clarification is requested.

Reconsideration is requested of all rejections based on 35 U.S.C. 103:

Examiner also relies on Fukui et al. for this rejection, together with several arguments of obviousness.

With respect to claim 2, Examiner states "Fukui et al. further shows the additional bias layer is CoFe/IrMn ([0044] line 9) whereby it has good exchange

coupling field with antiferromagnetic layers. Fukui et al does not specifically state that the additional bias layer has an effective coercivity that is between about 0.05 and 0.75 times that of the permanent magnet layer.

However, Fukui et al shows that the permanent magnet layer should have coercivity of 2 KOe ([0029] lines 3-4). And the resulted coercivity is the difference between the coercivity of the permanent magnet and the coercivity of the additional bias layer. In instance case, the resulted coercivity is 1 Koe ([0029] lines 1-2), the coercivity of the permanent magnet is 2 KOe. Therefore, the effective coercivity of the additional bias layer is 2 KOe - 1 KOe = 1 Koe; which is 0.5 times that of the permanent magnetic layer".

There are a number of invalid statements contained within the above quotation:

(1) the additional bias layer is CoFe/IrMn ([0044] line 9). What is stated on line 9 of [0044] is (starting at line 8) "**first** magnetic domain control layer [CoFe/IrMn (or PtMn)]...." (emphasis added). Actually, Fukui et al. give the composition of the second magnetic domain control layer to be "..a two-layered structure such as CoCrPt/NiFe or a three-layered structure such as CoCrPt/NiFe/CoFe." [0029 lines 6-10]. None of these compositions/structures are to be found in our claims 2, 13, 21, or 29.

(2) the resulted coercivity is the difference between the coercivity of the permanent magnet and the coercivity of the additional bias layer. There is no such quantity as a resultant coercivity between two bodies. Coercivity is the value of the magnetic field that is required to reduce the magnetic induction within a body to zero. It is an inherent property of that body and is not influenced by the presence of other magnetized bodies.

(3) resulted coercivity is 1 Koe ([0029] lines 1-2). As implied in (2) above, one

cannot compute the magnitude of the coercivity in this manner. In fact, Fukui et al. don't give a value for the coercivity of the second control layer, either directly or indirectly. The closest they come is in noting that it is to be magnetized by a field between the coercivity of the first and second domain layers (which is, of course, self-evident).

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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